PATENT ABSTRACTS OF JAPAN

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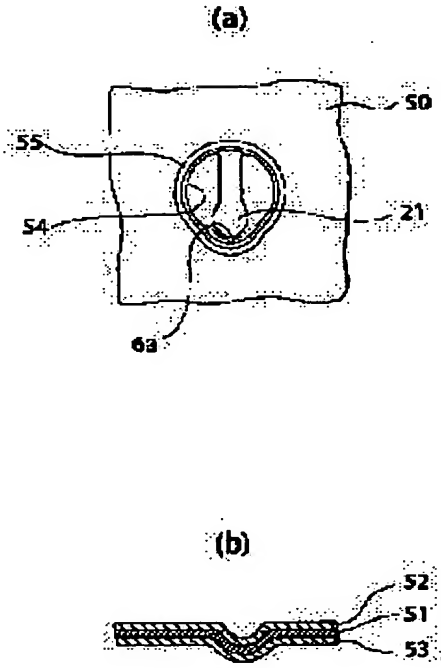
(71)Applicant : ZEXEL VALEO CLIMATE CONTROL CORP
(72)Inventor : KANAI HIROSHI

(54) RECIPROCATING REFRIGERATING COMPRESSOR

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a reciprocating refrigerating compressor with high volumetric efficiency.
SOLUTION: A gasket 50 suppressing leakage of a refrigerant is arranged between a cylinder block and a suction valve 21 disposed at a front side of a valve plate. A through-hole 54 is formed at an opposite position of a suction port communicating a compression chamber and a suction chamber of the gasket 50. An annular bead part 55 is formed around a periphery of the through-hole 54. As a result, comparing with the case when an annular bead part is formed such as a previous case spacing forming between the gasket 50 and the suction valve 21 becomes smaller to decrease a dead volume of the compression chamber 22 and increase a volumetric efficiency.



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[Date of final disposal for application]

[Patent number]

[Date of registration]

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* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] The cylinder block which has a cylinder bore, and the compression space which is formed in said cylinder block and compresses a refrigerant, The low pressure chamber which is fixed to said cylinder block and supplies a refrigerant to said compression space, The cylinder head in which the hyperbaric chamber into which a refrigerant flows from said compression space was formed, The valve plate for being arranged between said cylinder blocks and said cylinder heads, and dividing said compression space and said hyperbaric chamber, and said low pressure chamber, The inhalation hole which it is formed [hole] in said valve plate and makes said compression space and said low pressure chamber open for free passage, In the both-way formula refrigerant compressor which has been arranged between said cylinder blocks and said valve plates, was formed in the gasket which suppresses the leakage of a refrigerant, and this gasket, and was equipped with said inhalation hole and the inhalation hole opposite hole which counters The both-way formula refrigerant compressor characterized by being formed so that a toe of bead may meet the periphery of said inhalation hole opposite hole at said gasket.
[Claim 2] The cylinder block which has a cylinder bore, and the compression space which is formed in said cylinder block and compresses a refrigerant, The low pressure chamber which is fixed to the end of said cylinder block and supplies a refrigerant to said compression space, The rear head in which the hyperbaric chamber into which a refrigerant flows from said compression space was formed, The front head in which the crank case in which it is fixed to the other end of said cylinder block, and a cam plate etc. is held was formed, The 1st path to which it is formed in said cylinder block and said hyperbaric chamber and said crank case are connected, The 2nd path to which it is formed in said cylinder block and said low pressure chamber and said crank case are connected, The valve plate for being arranged between said cylinder blocks and said rear heads, and dividing said compression space and said hyperbaric chamber, and said low pressure chamber, The gasket which is arranged between said cylinder blocks and said valve plates, and suppresses the leakage of a refrigerant, In the both-way formula refrigerant compressor which was formed in this gasket, was formed in said 1st path, the 1st hole which counters, and this gasket, and was equipped with said 2nd path and the 2nd hole which counters The both-way formula refrigerant compressor characterized by being formed so that a toe of bead may surround either [at least] said 1st hole or said 2nd hole to said gasket.
[Claim 3] The cylinder block which has a cylinder bore, and the compression space which is formed in said cylinder block and compresses a refrigerant, The low pressure chamber which is fixed to the end of said cylinder block and supplies a refrigerant to said compression space, The rear head in which the hyperbaric chamber into which a refrigerant flows from said compression space was formed, The front head in which the crank case in which it is fixed to the other end of said cylinder block, and a cam plate etc. is held was formed, The 1st path to which it is formed in said cylinder block and said hyperbaric chamber and said crank case are connected, The 2nd path to which it is formed in said cylinder block and said low pressure chamber and said crank case are connected, The valve plate for being arranged between said cylinder blocks and said rear heads, and dividing said compression space and said hyperbaric chamber, and said low pressure chamber, The inhalation hole which it is formed [hole] in said valve plate and makes

said compression space and said low pressure chamber open for free passage, The gasket which is arranged between said cylinder blocks and said valve plates, and suppresses the leakage of a refrigerant, The inhalation hole opposite hole which is formed in said gasket and counters with said inhalation hole, In the both-way formula refrigerant compressor which was formed in this gasket, was formed in said 1st path, the 1st hole which counters, and this gasket, and was equipped with said 2nd path and the 2nd hole which counters The both-way formula refrigerant compressor characterized by being formed so that a toe of bead may surround said 1st hole, said 2nd hole, and said inhalation hole opposite hole to said gasket.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] Especially this invention relates to a both-way formula refrigerant compressor suitable as a refrigerant compressor of the air conditioner for cars using CO2 (carbon dioxide) as a refrigerant about a refrigerant compressor.
[0002]
[Description of the Prior Art] The both-way formula refrigerant compressor is equipped with the gasket arranged between the valve plate arranged between the cylinder block which has a cylinder bore, the compression space formed in the cylinder block, the rear head fixed to the cylinder block, and a cylinder block and a rear head, the inhalation port formed in the valve plate, and a cylinder block and a valve plate, and the through tube formed in this gasket.
[0003] The inhalatorium which supplies a refrigerant to compression space, and the regurgitation room where a refrigerant flows from compression space are formed in the rear head.
[0004] The part plan of a cylinder block and drawing 7 of the part plan of the gasket of the former [drawing 5] and drawing 6 R> 6 are the part plans of a suction valve portion.
[0005] The through tube 254 which counters a gasket 250 with the cylinder bore 206 of a cylinder block 201, and has magnitude almost equivalent to a cylinder bore 206, the free passage way 282 which makes a crank case (not shown) and an inhalatorium (not shown) open for free passage — countering — this free passage way 282 and abbreviation — with the through tube 272 which has equivalent magnitude It counters with the free passage way 286 which makes a crank case and a regurgitation room (not shown) open for free passage, and the through tube 276 which has magnitude almost equivalent to this free passage way 286, and the through hole 280 for letting the conclusion bolt which combines a cylinder block 201, a rear head, etc. with shaft orientations in one pass are formed.
[0006] The toe of bead 255 of the shape of a circular ring as the seal section which surrounds the opening edge of a cylinder bore 206 is formed in the perimeter of a through tube 254. This toe of bead 255 is formed by incurvating a gasket 250 in a convex configuration partially.
[0007]
[Problem(s) to be Solved by the Invention] Where a gasket 250 is pinched by the cylinder block 201 and the suction valve portion 213, when a conclusion bolt is bound tight, the clamping force of shaft orientations concentrates on the circular ring-like toe of bead 255, a toe of bead 255 is crushed, and the seal of the perimeter of the opening edge of a cylinder bore 206 is carried out.
[0008] Consequently, the leakage of the high-pressure refrigerant gas from between a cylinder block 201 and suction valve portions 213 can be controlled.
[0009] However, since a toe of bead 255 cannot be crushed completely, it is difficult to generate a clearance between a gasket 250 and a suction valve portion 213 into parts other than toe-of-bead 255, and to carry out the seal of the parts other than toe-of-bead 255 completely.
[0010] Therefore, there is a problem described below in this both-way formula refrigerant compressor.
[0011] ** Notching 206a which regulates the lift of a suction valve portion 213 is formed in the opening edge of a cylinder bore 206. And the suction valve portion 213 is setting the outside of

this notching 206a to seal section 213a.
[0012] Therefore, it is necessary to take into consideration the location of seal section 213a of not only the cylinder bore 206 but the suction valve portion 213 for formation of a toe of bead 255.
[0013] However, since the toe of bead 255 is in a circle, only the part of notching 206a becomes a major diameter, the clearance formed between a cylinder block 201 and a suction valve portion 213 becomes large, the dead volume of compression space increases, and volumetric efficiency gets worse.
[0014] ** A diaphragm is prepared in the free passage way 282 which makes a crank case and a rear head open for free passage, and the flow rate of the refrigerant gas which passes along the free passage way 282 with this drawing is set up.
[0015] However, the clearance between the outsides of the circular ring-like toe of bead 255 serves as a crank case pressure, big differential pressure (a maximum of 3 MPa extent) occurs between a crank case and the rear-side of drawing of the free passage way 282, the refrigerant gas more than a setting flow rate flows on the free passage way 282, and volumetric efficiency gets worse.
[0016] This invention was made in view of such a situation, and that technical problem is offering the both-way high formula refrigerant compressor of volumetric efficiency.
[0017]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem invention according to claim 1 The cylinder block which has a cylinder bore, and the compression space which is formed in said cylinder block and compresses a refrigerant, The low pressure chamber which is fixed to said cylinder block and supplies a refrigerant to said compression space, The cylinder head in which the hyperbaric chamber into which a refrigerant flows from said compression space was formed, The valve plate for being arranged between said cylinder blocks and said cylinder heads, and dividing said compression space and said hyperbaric chamber, and said low pressure chamber, The inhalation hole which it is formed [hole] in said valve plate and makes said compression space and said low pressure chamber open for free passage, In the both-way formula refrigerant compressor which has been arranged between said cylinder blocks and said valve plates, was formed in the gasket which suppresses the leakage of a refrigerant, and this gasket, and was equipped with said inhalation hole and the inhalation hole opposite hole which counters It is characterized by being formed so that a toe of bead may meet the periphery of said inhalation hole opposite hole at said gasket.
[0018] The inhalation hole with which the toe of bead formed in the gasket makes compression space and a low pressure chamber open for free passage is surrounded, and the seal of the inhalation hole is carried out certainly.
[0019] The cylinder block with which invention according to claim 2 has a cylinder bore, The compression space which is formed in said cylinder block and compresses a refrigerant, and the low pressure chamber which is fixed to the end of said cylinder block and supplies a refrigerant to said compression space, The rear head in which the hyperbaric chamber into which a refrigerant flows from said compression space was formed, The front head in which the crank case in which it is fixed to the other end of said cylinder block, and a cam plate etc. is held was formed, The 1st path to which it is formed in said cylinder block and said hyperbaric chamber and said crank case are connected, The 2nd path to which it is formed in said cylinder block and said low pressure chamber and said crank case are connected, The valve plate for being arranged between said cylinder blocks and said rear heads, and dividing said compression space and said hyperbaric chamber, and said low pressure chamber, The gasket which is arranged between said cylinder blocks and said valve plates, and suppresses the leakage of a refrigerant, In the both-way formula refrigerant compressor which was formed in this gasket, was formed in said 1st path, the 1st hole which counters, and this gasket, and was equipped with said 2nd path and the 2nd hole which counters It is characterized by being formed so that a toe of bead may surround either [at least] said 1st hole or said 2nd hole to said gasket.
[0020] At least one side of the 2nd path which connects the 1st path and low pressure chamber to which the toe of bead formed in the gasket connects the hyperbaric chamber and a crank

case, and a crank case is surrounded, and the seal of either [at least] the 1st path or the 2nd path is carried out certainly.

[0021] The cylinder block with which invention according to claim 3 has a cylinder bore, The compression space which is formed in said cylinder block and compresses a refrigerant, and the low pressure chamber which is fixed to the end of said cylinder block and supplies a refrigerant to said compression space, The rear head in which the hyperbaric chamber into which a refrigerant flows from said compression space was formed, The front head in which the crank case in which it is fixed to the other end of said cylinder block, and a cam plate etc. is held was formed, The 1st path to which it is formed in said cylinder block and said hyperbaric chamber and said crank case are connected, The 2nd path to which it is formed in said cylinder block and said low pressure chamber and said crank case are connected, The valve plate for being arranged between said cylinder blocks and said rear heads, and dividing said compression space and said hyperbaric chamber, and said low pressure chamber, The inhalation hole which it is formed [hole] in said valve plate and makes said compression space and said low pressure chamber open for free passage, The gasket which is arranged between said cylinder blocks and said valve plates, and suppresses the leakage of a refrigerant, The inhalation hole opposite hole which is formed in said gasket and counters with said inhalation hole, In the both-way formula refrigerant compressor which was formed in this gasket, was formed in said 1st path, the 1st hole which counters, and this gasket, and was equipped with said 2nd path and the 2nd hole which counters It is characterized by being formed so that a toe of bead may surround said 1st hole, said 2nd hole, and said inhalation hole opposite hole to said gasket.

[0022] The 1st path to which the toe of bead formed in the gasket connects the hyperbaric chamber and a crank case, the 2nd path which connects a low pressure chamber and a crank case, and the inhalation hole which makes compression space and a low pressure chamber open for free passage are surrounded, and the seal of the 1st path, the 2nd path, and the inhalation hole is carried out certainly.

[0023]

[Embodiment of the Invention] The gestalt of implementation of this invention is explained based on a drawing below.

[0024] Drawing 1 is drawing of longitudinal section showing the swash-plate-type compressor concerning the 1st operation gestalt of this invention.

[0025] This swash-plate-type compressor (both-way formula refrigerant compressor) is used as one component part of the freezer which uses CO2 (carbon dioxide) as a refrigerant.

[0026] The front head 4 is arranged for the rear head (cylinder head) 3 through the valve plate 2 in the other end side at the end side of the cylinder block 1 of this swash-plate-type compressor.

[0027] The front head 4, the cylinder block 1, the valve plate 2, and the rear head 3 are combined with shaft orientations in one with the through bolt 31 and the nut 32.

[0028] Into the cylinder bore 6 formed in the cylinder block 1, the piston 7 is inserted possible [sliding]. Moreover, notching 6a for restricting the amount of lifts of the suction valve portion 21 mentioned later to a cylinder block is formed.

[0029] The crank case 8 in which the cam plate 10 and thrust flange 40 grade which are mentioned later are held is formed in the front head 4.

[0030] The inhalatorium (low pressure chamber) 13 and the regurgitation room (hyperbaric chamber) 12 are formed in the rear head 3.

[0031] The inhalatorium 13 is located in the perimeter of the regurgitation room 12. A refrigerant gas is supplied to compression space 22 from an inhalatorium 13, and a refrigerant gas flows into the regurgitation room 12 from compression space 22.

[0032] The end section of a shaft 5 is supported by the front head 4 pivotable through radial bearing 26, and the other end of a shaft 5 is supported by the cylinder block 1 pivotable through thrust bearing 24 and radial bearing 25.

[0033] It is fixed to a shaft 5 and the thrust flange 40 is rotated to a shaft 5 and one.

[0034] The cam plate 10 is attached in the shaft 5 possible [an inclination and sliding]. Moreover, a cam plate 10 is connected with the thrust flange 40 through a link mechanism 41,

and rotates to one along with rotation of the thrust flange 40.
[0035] The periphery section of a cam plate 10 and the end section of a piston 7 are connected through shoes 60 and 61. Shoes 60 and 61 have the spherical surfaces 60a and 61a and flat surfaces 60b and 61b.
[0036] Arranged so that the shoes 60 and 61 of a lot may sandwich a cam plate 10 to a piston 7, respectively, shoes 60 and 61 carry out relative rotation of the sliding-surface 10a [of a cam plate 10], and 10b top along with rotation of a shaft 5. A piston 7 carries out the straight-line reciprocating motion of the inside of a cylinder bore 6 by rotation of a cam plate 10.
[0037] A valve plate 2 is arranged between a cylinder block 1 and the rear head 3, and divides compression space 22, the regurgitation room 12, and an inhalatorium 13.
[0038] The inhalation port (inhalation hole) 15 which makes this valve plate 2 open for free passage the regurgitation port 16 which makes compression space 22 and the regurgitation room 12 open for free passage, and compression space 22 and an inhalatorium 13 is formed every fixed spacing along the hoop direction, respectively.
[0039] The regurgitation port 16 is opened and closed by the discharge valve 17, and the discharge valve 17 is being fixed to the rear head side edge side of a valve plate 2 with the bolt 19 and the nut 20 with the valve guard 18.
[0040] Moreover, the inhalation port 15 is opened and closed by the suction valve portion 21, and the suction valve portion 21 is arranged in the front-side end face of a valve plate 2.
[0041] The thrust flange 40 fixed to the shaft 5 is supported by the internal surface of the front head 4 pivotable through thrust bearing 33.
[0042] As mentioned above, the thrust flange 40 and a cam plate 10 are connected through a link mechanism 41, and a cam plate 10 can incline to a shaft 5 and a right-angled field.
[0043] A link mechanism 41 consists of bracket 10c prepared in the sliding-surface 10b side of a cam plate 10, and 10d of linear guide slots formed in bracket 10c and the rod 43 fixed to the thrust flange 40.
[0044] The longitudinal shaft of 10d of guide slots leans the degree of predetermined angle to sliding-surface 10b of a cam plate 10. Spherical point 43a of a rod 43 has fitted into 10d of guide slots possible [relative sliding].
[0045] It is equipped with the Maki spring 47 between the thrust flange 40 and a cam plate 10, and a cam plate 10 is energized by the energization force of this Maki spring 47 to a rear-side, it is equipped with the Maki spring 48 between thrust bearing 24 and a cam plate 10, and a cam plate 10 is energized by the energization force of this Maki spring 48 to a front-side.
[0046] Drawing 2 (a) is A view Fig. of drawing 1 , and drawing 2 (b) is the sectional view of a gasket.
[0047] Between the cylinder block 1 (refer to drawing 1) and the suction valve portion 21, the gasket 50 which suppresses the leakage of a refrigerant is arranged.
[0048] Two or more formation of the through tube (inhalation hole opposite hole) 54 of the magnitude of a cylinder bore 6 and an abbreviation EQC is carried out in the location which corresponded to the gasket 50 with each cylinder bore 6 of a cylinder block 1.
[0049] A through tube 54 counters with the inhalation port 15. This through tube 54 is almost circular, and the part corresponding to notching 6a formed in the cylinder bore 6 has swollen to the method of the outside of radial.
[0050] The annular toe of bead 55 which surrounds a through tube 54 is formed in the periphery of the through tube 54 of a gasket 50.
[0051] This annular toe of bead 55 is formed by incurvating a gasket 50 in a convex configuration in the suction valve portion 21 direction partially.
[0052] The gasket 50 consists of a metal plate 51 and rubber material 52 and 53 which fixed to both sides of this metal plate 51, respectively, as shown in drawing 2 (b).
[0053] Next, actuation of this swash-plate-type compressor is explained.
[0054] If the rotational motion force of the mounted engine which is not illustrated is transmitted to a shaft 5, the turning effort of a shaft 5 will be transmitted to a cam plate 10 through the thrust flange 40 and the hinge device 41, and a cam plate 10 will rotate it.
[0055] Shoes 60 and 61 carry out relative rotation of the sliding-surface 10a [of a cam plate

10], and 10b top by rotation of a cam plate 10, and the turning effort from a cam plate 10 is changed into the straight-line reciprocating motion of a piston 7.
[0056] If a piston 7 reciprocates the inside of a cylinder bore 6, the volume of the compression space 22 in a cylinder bore 6 will change, inhalation of a refrigerant gas, compression, and the regurgitation will be performed one by one by this volume change, and the high-pressure refrigerant gas of capacity according to whenever [tilt-angle / of a cam plate 10] will be breathed out.
[0057] At the time of inhalation, a suction valve portion 21 opens, a low-pressure refrigerant is inhaled from an inhalatorium 13 to the compression space 22 in a cylinder bore 6, at the time of the regurgitation, a discharge valve 17 opens and a high-pressure refrigerant gas is breathed out from compression space 22 at the regurgitation room 12.
[0058] According to this operation gestalt, since the annular toe of bead 55 is formed along the periphery of the through tube 54 of a gasket 50, the clearance formed between a gasket 50 and a cylinder block 1 compared with the conventional example becomes small, dead volume decreases, and volumetric efficiency improves.
[0059] The part plan showing the important section of the swash-plate-type compressor which drawing 3 requires for the 2nd operation gestalt of this invention, and drawing 4 are the sectional views which met the IV-IV line of drawing 3 , give the same sign to the same part as the above-mentioned operation gestalt, and that explanation is omitted.
[0060] This operation gestalt is formed in not only the perimeter of a through tube 54 but the free passage hole 71, and the corresponding location, mostly, is formed in the free passage hole 71, and the perimeter of the through tube (the 1st hole) 72 of the diameter of said, the free passage hole 75 and the corresponding location, and differs from the 1st operation gestalt with the free passage hole 75 at the point which formed the toe of bead 156,157 in the perimeter of the through tube (the 2nd hole) 76 of the diameter of said, respectively.
[0061] The free passage hole 71 is formed in a cylinder block 1, and this free passage hole 71 constitutes a part of path (the 1st path) 81 which makes the regurgitation room 12 and a crank case 8 open for free passage.
[0062] The oil separated with the oil separator (not shown) is supplied to a crank case 8 through the free passage hole 71.
[0063] It extracts in the middle of the free passage hole 71, 73 is prepared, and the flow rate of the oil which passes along the free passage hole 71 with this drawing 73 is adjusted.
[0064] The free passage hole 75 is formed in a cylinder block 1, and this free passage hole 75 constitutes a part of path (the 2nd path) 85 which makes an inhalatorium 13 and a crank case 8 open for free passage.
[0065] It extracts in the middle of the free passage hole 75, 78 is prepared, and the flow rate of the refrigerant gas which passes along the free passage hole 75 with this drawing 78 is adjusted.
[0066] There is a refrigerant gas passageway (not shown) which makes the regurgitation room 12 and a crank case 8 open for free passage independently [a path 81] in the swash-plate-type compressor of this operation gestalt, and while being this refrigerant gas passageway, the control valve (not shown) which can adjust this path cross-sectional area is prepared.
[0067] When a thermal load becomes large, a control valve carries out clausilium actuation, the path cross section of a refrigerant gas passageway decreases, while the refrigerant gas which flows from the regurgitation room 12 to a crank case 8 is controlled, the refrigerant gas in a crank case 8 falls out to an inhalatorium 13 through a path 85, the pressure of a crank case 8 becomes low, and whenever [tilt-angle / of a cam plate 10] becomes large.
[0068] On the other hand, when a thermal load becomes small, a control valve carries out valve-opening actuation, the path cross section of a refrigerant gas passageway increases, and a refrigerant gas flows from the regurgitation room 12 to a crank case 8. Although it escapes from the refrigerant gas in a crank case 8 to an inhalatorium 13 through a path 85 at this time, in order that the drawing function of the drawing 78 in a path 85 may work, the pressure of a crank case 8 becomes high and whenever [tilt-angle / of a cam plate 10] becomes small.
[0069] Although big differential pressure occurs between the rear-sides of diaphragm 73 and the outsides of the toe of bead 156 of a crank case pressure used as high pressure at this time,

since seal nature is improving by the toe of bead 156, it is hard to generate the leakage resulting from differential pressure.
[0070] Moreover, although big differential pressure occurs between the rear-sides of diaphragm 75 and toe-of-bead 157 outsides of a crank case pressure used as low voltage, since seal nature is improving by the toe of bead 157, it is hard to generate the leakage resulting from differential pressure.
[0071] Since according to this operation gestalt a toe of bead 157 is formed in the perimeter of a through tube 76 and a refrigerant gas cannot flow from the outside of a toe of bead 157 easily to a through tube 76, volumetric efficiency improves rather than the 1st operation gestalt.
[0072] Moreover, ** is [that it is hard to carry out DESUTO roke resulting from the fall of the pressure of a crank case] cancelable.
[0073] Furthermore, since a toe of bead 156 is formed in the perimeter of a through tube 72 and a refrigerant gas cannot flow from the inside of a toe of bead 156 easily to a through tube 72, volumetric efficiency improves rather than the 1st operation gestalt.
[0074] Moreover, ** is [that it is hard to carry out the stroke resulting from the increment in the pressure of a crank case] cancelable.
[0075] In addition, the invention in this application is applicable similarly to the path which makes a control valve and a crank case open for free passage.
[0076] The through tube of the diameter of said is mostly formed in a path and the corresponding location with a path at a gasket. A toe of bead is formed in the perimeter of a through tube.
[0077] Therefore, the flow more than the specified quantity resulting from differential pressure does not occur to a path, but volumetric efficiency improves more.
[0078] Although each above-mentioned operation gestalt explained by the case where the invention in this application is applied to the gasket 150 formed between the cylinder block 1 and the suction valve portion 21, the invention in this application may be applied to the gasket 150 formed between the rear head 3 and the valve plate 2.
[0079]
[Effect of the Invention] As explained above, according to the both-way formula refrigerant compressor of invention according to claim 1, compared with the conventional example, the clearance between a gasket and a cylinder block becomes small, the dead volume of compression space decreases, and volumetric efficiency improves.
[0080] According to the both-way formula refrigerant compressor of invention according to claim 2, since the flow of the refrigerant gas between the outside of a toe of bead and a path is lost, volumetric efficiency improves.
[0081] According to the both-way formula refrigerant compressor of invention according to claim 3, while the flow of the refrigerant gas between the outside of a toe of bead, the 1st path, and the 2nd path is lost, the clearance surrounded by the toe of bead becomes narrow compared with a circular toe of bead, the dead volume of compression space decreases, and volumetric efficiency improves more.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Drawing 1 is drawing of longitudinal section showing the swash-plate-type compressor concerning the 1st operation gestalt of this invention.
[Drawing 2] Drawing 2 (a) is A view Fig. of drawing 1 , and drawing 2 (b) is the fragmentary sectional view of a gasket.
[Drawing 3] Drawing 3 is part plan **** which shows the important section of the swash-plate-type compressor concerning the 2nd operation gestalt of this invention.
[Drawing 4] Drawing 4 is the sectional view which met the IV-IV line of drawing 3 .
[Drawing 5] Drawing 5 is the part plan of the conventional gasket.
[Drawing 6] Drawing 6 is the part plan of a cylinder block.
[Drawing 7] Drawing 7 is the part plan of a suction valve portion.
[Description of Notations]
1 Cylinder Block
2 Valve Plate
3 Rear Head (Cylinder Head)
6 Cylinder Bore
12 Regurgitation Room (Hyperbaric Chamber)
13 Inhalatorium (Low Pressure Chamber)
15 Inhalation Port (Inhalation Hole)
22 Compression Space
50,150 Gasket
54 Through Tube (Inhalation Hole Opposite Hole)
55,155 Toe of bead
72 Through Tube (1st Hole)
76 Through Tube (2nd Hole)
81 Free Passage Way (1st Path)
85 Free Passage Hole (2nd Path)

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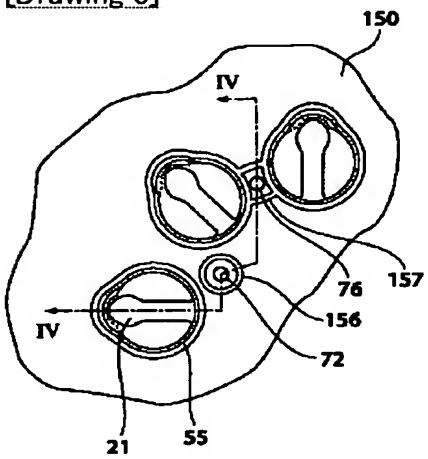
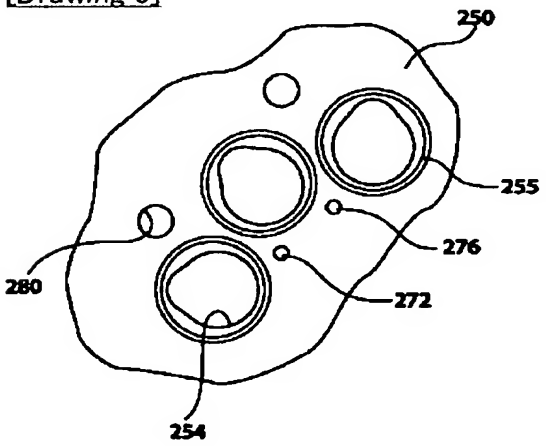
DRAWINGS

[Drawing 3]



[Drawing 5]



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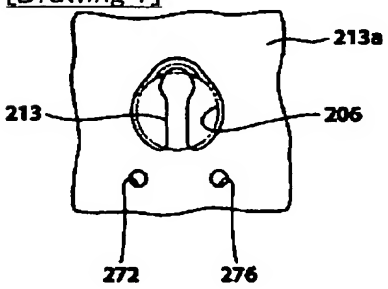
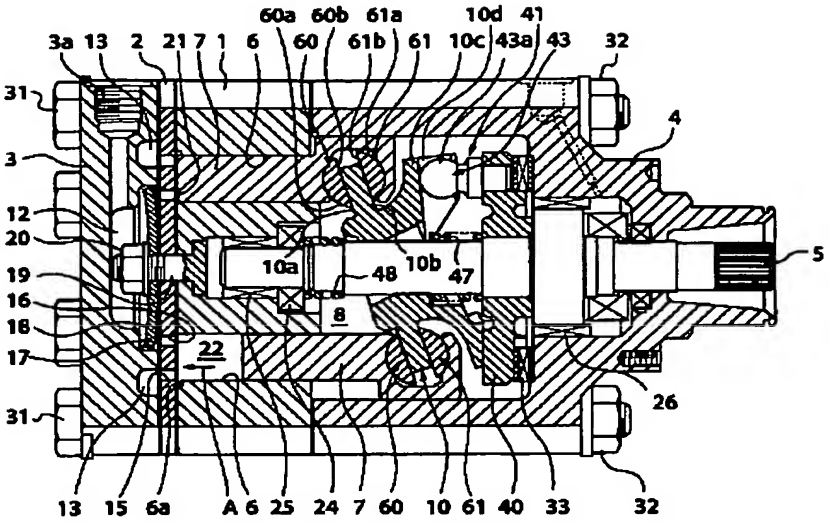
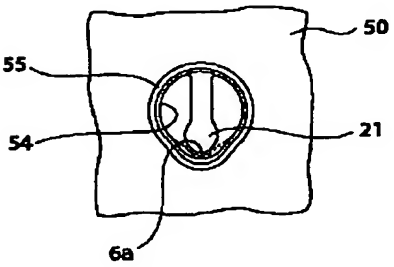


[Drawing 1]



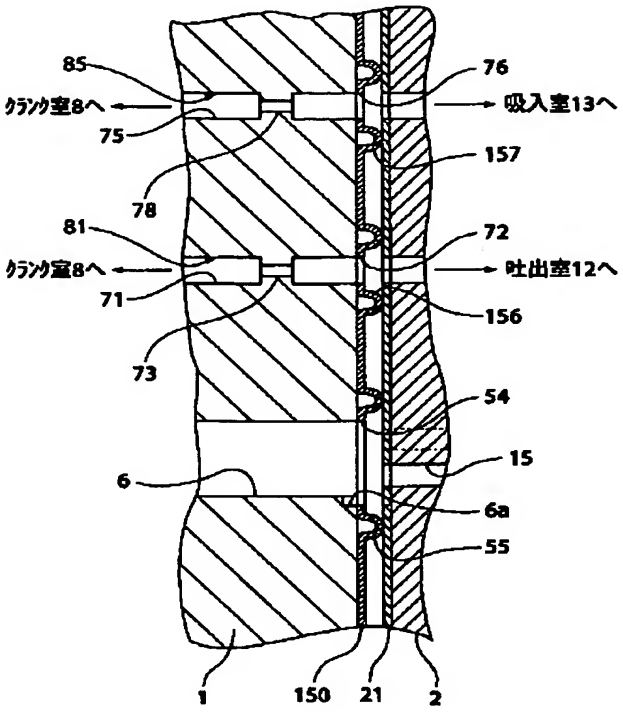
[Drawing 2]

(a)

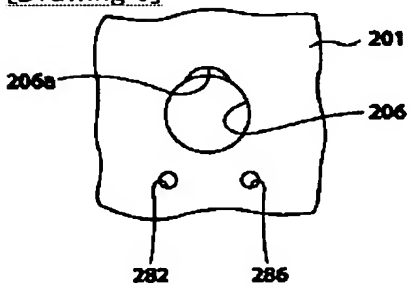


(b)

[Drawing 4]



[Drawing 6]



[Translation done.]